Our "Acres of Diamonds"

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United States Government scientists in the wilds.

is scarcely a line in their reports bearing on their personal adventures. This, despite the fact that their wanderings in Alaska have been more extensive and adventurous than those of all other explorers who have written about the Arctic.

Another job cared for by the Survey is that of checking up on the worth-while streams of the country. This is of great importance, for water power cannot well be developed until it is first accurately measured. Any one capable of working a simple sum in arithmetic may measure the flow of a river—if you don't know, the Survey will gladly tell you how; but it takes years of observation and record-keeping to show what flow may be depended on at different periods during the year and for future years, the flow of a stream fluctuating with the years as well as with the seasons.

The statistical work includes figures in detail on domestic output and foreign influx of all the minerals. These are issued in book form at the end of each year.

The Survey is now issuing a world atlas of commercial geology. It is based on data collated for the American representatives at the Peace Conference.

"Experience gained during the war," says a Survey publication with reference to this world atlas, the first volume of which is now being circulated, "emphasizes the advantage of an adequate supply of raw materials close at hand. Yet there are certain economic limits to domestic independence in raw materials, as shown by readjustments already made. The more facts we possess bearing upon the relative quantity and the relative availability of the mineral resources of our own and other countries, the better able will be our captains of industry to decide whence they may advantageously derive their raw material." We import as well as export large quantities of minerals, and the imports are not confined to those not found in our own mines. Certain minerals that we possess in large quantities, like manganese, are liberally imported because of cheaper labor or richer veins in other countries, or because transportation favors importation.

The great desideratum of the Geological Survey is to be able to give accurate advice about minerals.

Every little while somebody sends in for examination by Survey experts what appears (to the sender) to be a diamond. Usually the specimen is simply white quartz. While actual diamonds are mined in Arkansas on a small scale, North American geological strata do not include the famous "blue clay" in which diamonds are found in large quantities in Africa.

It may be asked, can the government's geologists pass on the promise of a gold or oil mine as they can on the quality of a supposed precious stone?

Yes and no.

They cannot tell what a specific mine-shaft or a "hole in the ground" will yield, but they can nearly always tell what it will not yield. Like the precious metals and petroleum, mineral-bearing ores go along with certain kinds of earth-strata as studied and diagramed for the country by the Survey. Thus it may be told with some certainty whether or not there is a prospect of finding oil or gold or silver in any particular area.

One of the big functions of the Survey is to give manufacturers correct information regarding the whereabouts and potentialities of various domestic mineral materials. This was a great help during the war when drastic readjustments had to be made in our industries. Another function is to promote conservation in the use of mineral wealth. It is estimated that only 76 of every 2,000 pounds of coal used in industry is turned into mechanical power. Much of the balance is left in the ground in a way that makes future recovery impossible, a great deal is wasted in transporting the coal to manufacturing plants and much more is wasted through imperfect use at the plant. For, though we have more mineral wealth than any other country, we have none to waste. It is as much the property of our grandchildren as ours.

But the great function of the Survey is to lend assistance in raising the mining and the mineral industries to the level of stability that their importance demands.

"Kinertia" Versus Einstein

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It will be particularly interesting to compare the conclusions of the two men concerning the nature of the path of the earth's motion in space.

Eddington.

"Consider, for example, two events in space-time, namely, the position of the earth at the present moment, and its position a hundred years ago. Call these events P^2 and P^1. In the interim the earth (being undisturbed by impacts) has moved so as to take the longest possible track from P^1 to P^2—or, if we prefer, so as to take the longest possible proper-time over the journey. In the weird geometry of the part of space-time through which it passes (a geometry which is no doubt associated in some way with our perception of the existence of a massive body, the sun) this longest track is a *spiral*—a circle in space drawn out into a spiral by continuous displacement in time. Any other course would have had a shorter interval-length."—("Space, Time and Gravitation," page 72.)

Wilson.

"Draw from the sun perpendicular to the plane of the earth's orbit a line which shall represent the time-axis and disregard the third spatial dimension. Now for each kilometer that the earth moves around in its orbit, it must be considered to move in time by 10,000 kilometers. The path of the earth in space and time on this diagram is therefore a *helix* with an extremely steep pitch winding once a year about the cylinder standing in the earth's orbit but advancing ten thousand billion kilometers while "circulating" one billion kilometers."—("Space, Time and Gravitation." The *Scientific Monthly*, March, 1920, page 227.)

"Kinertia."

"The possible motion of the sun in space, as adrift with the planets, was anticipated by Newton; but the laws of motion prevented him from reaching the true *corkscrew* path of the planets in space as they revolve round the sun."—("Do Bodies Fall?" *Harper's Weekly*, September 19, 1914, page 285.)

In this connection we submit as corroborative evidence of the highest import, the illustration of this *corkscrew* path of the earth and moon which was used to elucidate "Kinertia's" article in *Harper's Weekly*, September 19, 1914, page 285.

This illustration, taken in conjunction with "Kinertia's" statement, quoted above, proves conclusively that the unknown "Kinertia" derived the same type of path for the earth's motion in space that Einstein claims as his original contribution.

We introduce the following final quotation in order definitely to fix the date of "Kinertia's" contribution:

"Kinertia."

"This statement is concerning a discovery in natural science and the ordinary phenomena of daily life, which I discovered about fifteen years ago while engaged in carrying on some experiments to verify what I had previously suspected to be the true physical cause of *Elasticity, Gravity, Weight and Energy.*"—("Do Bodies Fall?" *Harper's Weekly*, August 29, 1914, page 210.)

Since this article bears the date 1914, it is clear that the year 1899, fifteen years earlier, is the date which can safely be regarded as the birth-year of "Kinertia's" theory of gravitation. We have seen that Einstein's first work on gravitation was done in the year 1911; consequently "Kinertia" antedates Einstein by twelve years.

We rest the case of "Kinertia" Versus Einstein on the evidence submitted in this article. If Einstein was aware of "Kinertia's" discovery then the appellation "plagiarist," bestowed upon him by his German professional colleagues, is eminently fitting. If, on the contrary, Einstein was unaware of this work, then he is, nevertheless, antedated by the work of "Kinertia." Einstein is at liberty to choose either horn of the dilemma.

The Democracy of Durham

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ments amounting to less than the rent of a house in town. Like the regulation farms, too, they were laid out with due regard to their purpose, being located on soil well adapted to gardening. While small, consisting of from two to four acres, they provide employment for the owner's spare time, and enable him to produce the bulk of the family's food.

One of the laborers last year sold products from his garden to the value of $450, in addition to working every week day for the farmers of the community. Besides this, his little place yielded the feed for a cow and all the green stuff required for a hundred hens. Even then all the vegetables that he raised were not utilized. Since, steps have been taken to organize an association of the laborers at Durham to facilitate the marketing of the produce that remains after the home needs are filled.

Not the least of the virtues of the Durham plan is that it gives the laborer an acknowledged place in the community. As Doctor Mead pointed out in the last annual report of the board, the American laborer will not live in a bunk house. "He will not stay on the land," Doctor Mead said, "if he has to compete with Asiatics, and he will not bring up his family where his wife and children have no social status. These things do not reflect on his industry and character. On the contrary, they show the strength of economic democracy in the American soul."

By the simple expedient of making every person in the settlement a home owner, this community has bridged the gulf that separates the different classes of rural society. Herein is the democracy of Durham.

When the settlers were erecting their homes, the state helped them to organize their purchases of building materials into carload shipments. In this way they obtained these materials at wholesale prices, with the result that, considering also the labor which the settlers themselves performed, many of their houses cost less than half what would have been the case with each settler buying individually. This was the beginning of co-operative effort among the settlers at Durham, a phase of the community's life which contributes largely to its success.

Collective purchasing since has extended to a number of farm supplies, it proving especially advantageous in obtaining a carload of purebred dairy cattle. Later, dairying having become one of the settlement's main industries, a central cream-skimming station was established, the farmers pooling their product and thus obtaining better prices for it.

A live stock breeders' association was formed, of which every farmer in the community is a member. By voluntary agreement this organization has limited the live stock breeding operations of the settlement to one breed, in the case of beef cattle, dairy cattle and swine, and to two breeds of sheep; thus giving direction to the community's purebred activities and effecting economies in procuring superior breeding stock.

The social life of Durham revolves about the community park, a tree-covered tract of twenty-two acres, which was set aside as a civic center and gathering place for the settlers. Here is located a spacious club house, at which the meetings referred to are held. There is also a dancing pavilion where, from April to October each year, are weekly dances, young and old, employed and employer, meeting here on equal terms and in the common bond of home ownership.

"The state is giving away nothing but an opportunity to become a home owner and a valuable citizen," Doctor Mead said while on a recent visit to Kansas, where the California plan is being earnestly considered. "The Durham project is now three years old and instead of costing the state money, the board could turn back to the state a profit of $180,000 over the interest already paid the state for the use of its capital. The board, however, instead of paying this money back to the state, will use it for additional community improvements, starting with a large community swimming pool."

Encouraged by the success at Durham, California has established a second and larger project along the same lines at Delhi, in the southern part of the state; the legislature in 1919 appropriated a million dollars for the extension of the land settlement work. The Delhi project comprises 8,561 acres. In the raw, this tract cost the state $809,331.47, one-third of which was paid shortly after the land was purchased.

While, in general, the Delhi plan is the same as that of Durham, the average farm in the second settlement is smaller than in the Sacramento Valley project. This is due to the fact that the Delhi settlement is in a district noted for raisin and melon growing and peach and apricot orchards, wherefore very intensive culture is required. The settler at Delhi also has thirty-six years, instead of twenty, in which to pay for his land; his means that, besides the interest, he must pay off but one per cent of the principal yearly.

In the two settlements, California has established, since May, 1918, more than 300 homes, under conditions that mark new standards of democracy in the rural life of America. What these homes mean can be expressed no better than in the simple language of one of the farm laborers paying his semi-annual installments on a plot of three acres at Durham, who was asked why he did not sell out.

"Where can I go to beat it?" countered the laborer. "Here I have my own home, my cow, my garden and some chickens. We have plenty to eat and there are plenty of jobs at fair wages. I have as much to say in community affairs as any citizen. The schools are excellent, and we are happy and contented and busy. Why should I sell out?"

Meaningful words are these—the tribute of the man on the ground to a rural life that satisfies.